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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/615,909 | 07/10/2003 | Wei-Fang Fan | 3226/20 | 9554 |
| 23338 | 7590 | 04/07/2004 | EXAMINER | |
| DENNISON, SCHULTZ, DOUGHERTY & MACDONALD 1727 KING STREET SUITE 105 ALEXANDRIA, VA 22314 | | | LEON, EDWIN A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2833 | |

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/615,909

Applicant(s)

FAN ET AL.

Examiner

Edwin A. León

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means", "comprises" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (U.S. Patent No. 6,464,511) in view of Beaman et al. (U.S. Patent No. 5,738,531). With regard to Claim 1, Watanabe et al. discloses a pin assembly for a BGA (24) based IC encapsulation, comprising an upper cover (31) comprising a plurality of longitudinal first channels (33) arranged in rows and columns, each first channel (33) including an upper first pin hole (33c) and a lower first spring receptacle (33b) in communication with the first pin hole (33c); a lower cover (32) coupled to the upper cover (31), the lower cover (32) comprising a plurality of longitudinal second channels (34) arranged in rows and columns, each second channel (34) including an upper second spring receptacle (34b) and a lower second pin hole (34c) in communication with the second spring receptacle (34b), and a plurality of longitudinal, conductive, detachable, and resilient pins (35) each comprising an upper pin (37) having a portion (37a) disposed in the first pin hole (33c) and the remaining portion (37b) projected from the first pin hole (33c), a lower pin (36) having a portion (38) disposed in the second pin hole (34c) and the remaining portion (39) projected from the second pin hole (34c), and an intermediate resilient member (41, 42) in a space (between 33b and 34b) defined by the first (33b) and the second (34b) spring receptacles, wherein in testing an encapsulated IC chip (24) the pin assembly is sandwiched between the IC chip (24) having a plurality of bottom balls (24a) and a circuit board (23) of an IC test device, the balls (24a) are rested on the upper pins (37), and the circuit board (23) is connected to

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the lower pins (36) so as to form an electrical connection between the balls (24a) and the circuit board (23). See Figs. 1-2C.

However, Watanabe et al. does not show the use of tin balls.

Beaman et al. discloses a similar connector (1) using of tin balls (2). See Column 3, Lines 59-65.

Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify the pin assembly of Watanabe by using tin balls as taught in Beaman et al. in order to avoid the reflow connection for purposes of burn-in, while providing a reliable connection. (Column 3, Lines 62-65)

With regard to Claim 2, Watanabe et al. discloses the upper pin (37) comprising a concave top. See Figs. 1-2C.

With regard to Claim 3, Watanabe et al. discloses the resilient member (41, 42) being a spring. See Figs. 1-2C.

With regard to Claim 4, Watanabe et al. discloses the first spring receptacle (33b) having a diameter larger than that of the first pin hole (33c) and the second spring receptacle (34b) having a diameter larger than that of the second pin hole (34c) respectively. See Figs. 1-2C.

With regard to Claim 5, Watanabe et al. discloses the resilient member (41, 42) being stopped by a joining portion (33a) of the first pin hole (33c) and the first spring receptacle (33b) and a joining portion (34a) of the second pin hole (34c) and the second spring receptacle (34b), respectively. See Figs. 1-2C.

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With regard to Claim 6, the combination of Watanabe et al. and ** discloses the claimed invention except for the upper pin, the lower pin, and the resilient member of each of the pins being integrally formed.

Still, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the upper pin, the lower pin, and the resilient member of each of the pins integral, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 1647 (1893). It is well known in the art of electrical connector that having all pieces in one piece would make the manufacturing process easier and less expensive.

With regard to Claim 7, Watanabe et al. discloses the upper pin (37), the lower pin (36), and the resilient member (41, 42) of each of the pins (35) being separately formed. See Figs. 1-2C.

With regard to Claim 8, Watanabe et al. discloses the upper pin (37) comprising a bottom collar (bottom of 37) urged against a top of the resilient member (41, 42) and the lower pin (36) comprises a top collar (top of 36) urged against a bottom of the resilient member (41, 42) respectively. See Figs. 1-2C.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gates et al. (U.S. Patent No. 6,524,115), Sinclair (U.S. Patent

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No. 6,341,962), Desai et al. (U.S. Patent No. 5,880,590), and Kato et al. (U.S. Patent No. 5,727,954) disclose pin assemblies for BGA connectors and having pins, springs and longitudinal channels.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edwin A. León whose telephone number is (571) 272-2008. The examiner can normally be reached on Monday - Friday 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571-272-2800, extension 33. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Edwin A. Leon
AU 2833

EAL
March 31, 2004